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## NOTES ON THE GEOLOGY OF THE ANTELOPE HILLS.

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Read (by title) before the Academy, at Topeka, January 2, 1903.

THE Antelope Hills form the most conspicuous landmark of western Day county, in Oklahoma. They are outlying remnants of an old plateau, probably of Tertiary age, situated on the south side of the South Canadian river, on the inside of a large bend. The distance of the river from the hills varies from about two miles on the west to ten on the north and four or five on the northeast. In general outline, the drainage of the area around the hills and inside the bend of the river resembles an open fan.

The following section was taken on the largest of the buttes:

4. Gentle covered slope at top.....	25 feet.
3. Gray sandstone.....	25 "
2. Sand or saccharoidal sandstone.....	30 "
1. Long covered slope to the river.....	460 "
Total.....	540 feet.

On top of the hills and near them were found many pebbles of flint, limestone, and several igneous rocks, including lava. The cementing material of the sandstone is calcium carbonate. The amount of it varies greatly, and it is sometimes found in concretion-like forms which contain comparatively little sand. These concretions weather out very unevenly, and give the edge of the sandstone the appearance of being covered with stalactites. Some of them are larger than a man's arm, while others are small. The soft saccharoidal sandstone below the cap-rock differs from it only in having less of the cementing material. The little that it does contain is irregularly distributed. Even in the sandy slopes and in the soil lower down, there are small concretions of carbonate of lime. A few scattered buffalo bones were found on and near the hills, and some fragments of larger fossil bones were found on the southwest slope of the largest butte.

Locally the two hills farthest east are known as the Twin Hills, because they are so nearly alike, and about three miles from the other four, which are called the Antelope Hills. None of them have any timber except a few crooked cedars around the edges. The area of the top of the largest butte is probably less than thirty acres, and the total area of the tops of the group would hardly exceed sixty acres. There is a small spring of good water at the base of the largest one, and a larger one about a quarter of a mile from the Twin hills.

The cap-rock of the Antelope Hills is at about the same level as the

top of the sand-hills which cover a large part of northern Day county, and differs only in having the cementing material. The fact that the Antelope hills can be seen for a long distance depends more on the height of the broad, gently sloping base than on the height or size of the steeper portion at the top. South and southwest of the buttes there are lower hills, rising with gentle, rounded slopes, and covered with a sandy soil. The whole appearance of the surrounding country seems to indicate that there was a local hardening in a Tertiary sand plain by the deposition of calcium carbonate in it. Later the South Canadian river cut though this plateau, making a bend to the north around the hardened part. Erosion went on rapidly in the loose sand near the river, but was checked by the hardened layer. Finally, the hardened portion was cut into several parts and left only in the tops of a few buttes which it still protects.